THE CENTRAL REGION CELEBRATES ITS TENTH!

CRAY MEMORIES AND REFLECTIONS

By Mark Sidmore

In putting together this 10th Anniversary Newsletter, we thought it would be interesting to hear from some of the employees who have been with the company for quite a while. We came up with a list of long-time employees and phoned them to see who was available for an interview. We were able to talk to seven individuals: Les Davis and Dean Roush from Hardware; Margaret Loftus and David Judd from Software; Irv Engebretson, Controller; Edna Bunn, Senior Administrator; and Bob Ewald from Corporate. (Bob has only been with the company for about two years, but has been associated with our systems since late 1976.)

Many of the same key points, as well as recurring themes, materialized during these interviews. In the past 10 years, we have experienced tremendous change in the technology we work with and with the tools we use to help us build systems. We anticipate an even greater rate of change in the next 10 years.

Our increase both in physical structures and the number of employees, has made it more difficult to communicate and be in touch with what is happening throughout the company. A comment made by Edna Bunn best typifies this situation. She said, "I don't even know everyone in our own building anymore."

If we are going to continue our company emphasis on small groups, we are going to have to spend more management time in coordinating the efforts between groups.

Following are some highlights of these interviews.

LES DAVIS

Les came to work for Cray in May 1972 as one of the original founders. Prior to that time he worked with Seymour at Control Data Corporation on the 6600 and 7600. At present he holds the position of Executive Vice President of Development and Manufacturing. In essence, about two-thirds of the company works for his direct reports.

During the development of Serial 1, he was instrumental in establishing ground rules and solving the layout problems of the boards. Les is the person that developed the prototype machine with Seymour and oversaw the transition from pre-production to manufacturing.

He remembers that when Cray began there was a consensus among the founders that there was a need in the market place for a faster machine than was available at the time. He said, "We had a clear direction. We were going to build a new and faster machine."

He remembers two feelings when Serial 1 was shipped. First, he remembers feeling glad it was gone. "I'm always glad when a machine is done," he commented. Second, he remembers being concerned that it was going on a trial basis rather than as a sale. He said, "We were an unproven company, and we had to establish that our machine would have the performance and reliability needed."

When we shipped Serial 8 to our first commercial customer, he felt confident in the hardware

The first CRAY-1 to be shipped, Serial 1 to Los Alamos National Labs, was loaded up from the Hallie Lab on March 4, 1976.

because we had installed several machines by then. But he remembers a bit of uncertainty about what software they would need.

When asked what we have learned in the past 10 years, Les responded, "There has not been a single significant learning experience. Rather it has been a steady learning process. It is a very dynamic industry, and you can't sit still."

In describing how we've changed over the years, he indicated that we have more projects, a slightly different culture, and, in addition to the increase in the number of people, a wider variety of people. He suggests that "this has brought a wider diversity of ideas on how to accomplish tasks, and a wider variety of wants and needs."

"In looking at the industry as a whole, we face a much broader range of customers with varying environments. Because of this, we have to address a wider range of customer needs to maintain our leadership position. In terms of our system, we have to have high quality hardware,

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software, and field support." Les emphasized that "good hardware is not enough any more."

In outlining what critical issues face us as a company today, he stated: "We need to be sensitive to how we pick our goals and to how we deal with our people. If we become too specialized, we can't maintain growth, but if we feel we are not specialized enough, we begin to lose our focus. So this is an area we have to be continually aware of."

DEAN ROUSH

Dean joined Cray in May 1972 as employee number three. Before that time he had worked with Seymour at Control Data Corporation on the 6600 and 7600. He remembers the original founding of the company as follows: "The original group kind of decided we would do it, then Seymour called a short little meeting. We sat around the table and decided what everybody was going to make. We just kind of cut it at one or two thousand dollars per year down the line, depending upon the reporting structure. Most of us took serious pay cuts." One of Dean's accomplishments is the design of the cooling system for the CRAY-1. In fact, he holds one of the two patents on the CRAY-1. Dean currently holds the position of Vice President of Engineering.

When asked how he felt when we shipped Serial 1, Dean recalled that machine had a poor mean-time-to-interrupt, and he was nervous about shipping it. He said, "Les came over and said we've got to get this thing out of here and quit letting these engineers muck around with it." In hindsight, Dean thinks Les was probably right, "Engineers tend to play with their baby and break it sometimes as much as they fix it."

In contrasting '76 with '86, he points out that the first system was a "make it or break it" situation. "Many of us, I'm sure, were looking at bankruptcy if it didn't work," he said.

When asked what mistakes we have made in the past 10 years, Dean indicated he thought we could do a better job of planning. Specifically, he said, "We add on to the buildings continually. You would think we would be able to look ahead and decide the size building we need and then build it. We also need to learn how to better introduce new products with minimal impact. The introduction of a new system that is faster and has more features than the current system causes customers with outstanding orders to ask for a discount or a delay in their order."

When asked what would be required of us in the future, Dean said in summary that we would need to "stick to our knitting"—to continue to build the biggest and the fastest. In an effort to do this, he pointed to the competitive projects we have going on within the company. "It takes a lot of bucks to maintain competitive projects, and I suspect some of the competitors look at the other competitor and think they are doing it wrong, but it seems to work. We have to keep running hard and remember to keep looking over our shoulder."

IRV ENGEBRETSON

Irv came to work for Cray full time in August 1972. Prior to that, he worked for Seymour at Control Data Corporation. He started working for Seymour in 1968 and was heavily involved in the administration and accounting associated with the 7600. In telling how he first learned to use a computer, he said "Seymour was between systems, and he set up the accounting system. He sat me down and showed me how to run the computer we had. I can remember him saying, 'Here, Irv, do this, then do that.'"

When the company was first beginning, Irv was in charge of all the accounting. Of course the accounting function has greatly expanded and changed during the past 10 years. At present Irv is the Controller at Chippewa Falls.

When asked why he joined Cray, he simply replied, "I figured if Seymour could build a 6600 and a 7600, he could surely build another machine."

In discussing our early financial situation, he commented that before we went public in March 1976, things were pretty tight financially. We had cut back on our vendor shipments and were down to about $200,000. Then we went public with a stock offering and raised about $10 million. He commented: "If we had not brought the stock money in, we would have probably run out of money at the end of March."

When asked to comment on key changes in the last 10 years, Irv said, "I used to know everybody in the company and what they were doing. I don't anymore." With four regions, five hardware projects, and over 3500 employees, it is very difficult to maintain the level of familiarity that Irv and others had in the beginning. As a result, communication has become increasingly important. The company realizes this and has taken steps (newsletters, electronic mail, etc.) to make sure we have effective communication.

In discussing the future, Irv made two key points. First, he discussed our need to hire key people and to maintain our lead in technology. In short, in his words, "We need to have continuous creativity." Second, he discussed the fact that in the next 10 to 20 years, the people who really started the company will be gone. He concluded that "when the founding people eventually leave the company, we will feel a real loss."
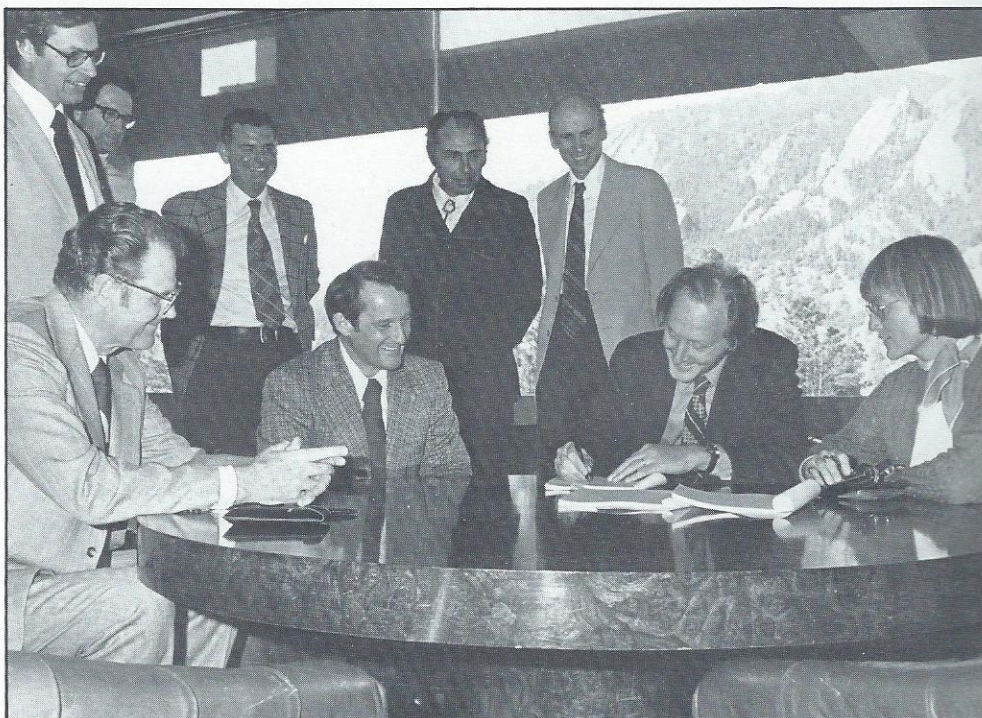
NCAR – Signing of contract for purchase of first CRAY in the Central Region (Serial #1 was leased): (left to right) Noel Stone, Lionel DiCharry, Paul Rotar, Stu Patterson, Seymour Cray, Cliff Murino, John Firor, Francis Bretherton, Harriett Crowe.
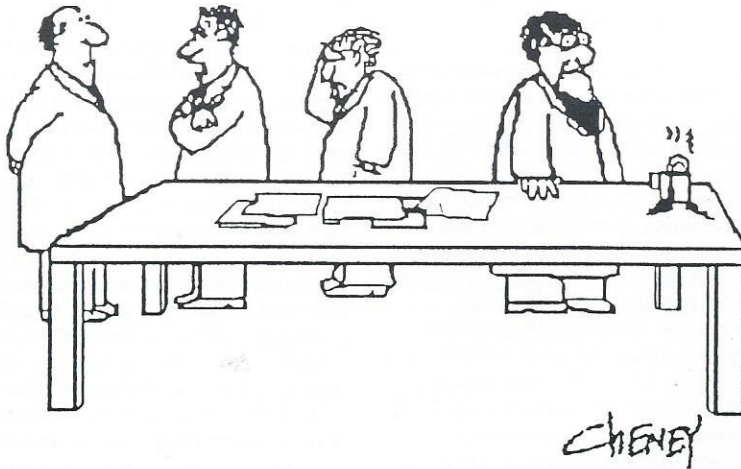
The good news is we've finally produced a Cray-6 prototype that's the size of a doughnut.
The bad news is Mr. Harmony just dunked it in his coffee.

MARGARET LOFTUS

Margaret came to work for Cray in May 1976. Prior to Cray she worked for Control Data Corporation, where she participated in the development of the operating systems for the 6600 and the 7600. At Cray, she initially started planning for our future software needs. That effort was soon put on a back burner when, on her third day of work, Seymour brought her a contract just signed by NCAR. The contract stated that we would do an operating system and assembler for them by October of the following year.

At that time, there was only a handful of software people, and they had a Data General Eclipse and a CRAY-1 simulation program for software development. Today, through her guidance and efforts (with the initial help of George Hanson), software development has over 300 people, and receives approximately a third of the company's research and development funds. Margaret's present position is Vice President of Software.

Reflecting back on the days at NCAR, she comments that "the software effort at NCAR was somewhat under a microscope. That was due to the skepticism on the part of many potential customers as to Cray Research's commitment to software. There was a feeling that we were strictly a hardware company and that this effort was possibly just a 'flash in the pan.'" When asked how we overcame that perception, Margaret responded: "We formally released our software in January 1978. At that point we were releasing quarterly enhancements and updates. We did that to show people we were serious about software." This pace was later slowed to a release every six months in order to allow

customers more time to familiarize themselves with the new releases.

When asked to comment on the difference between '76 and '86, Margaret indicated that the major change is in resources. At present, Software Development has an increased quantity of people, funds, and hardware and software tools. "In 1976," she said, "everything was a struggle. There was nothing we had to do that was easy, whether it was just the mechanics of the job or the task itself."

Today, Software Development still faces very challenging jobs and tasks, but they are much better equipped to deal with these challenges and are also in a position to ensure they stay well equipped to deal with the jobs and tasks of tomorrow.

When asked what she thought would be required to maintain our leadership in terms of people, she replied that a key point was the ability to attract and retain quality people with high talent. She felt that one way to accomplish this is "to provide strong management coupled with good performance planning. Make sure people know what is expected of them. When they have a question, give them a straight answer."

When asked to make a concluding comment, Margaret said, "Ten years ago no one envisioned Cray Research doing as well as it has. We worked hard, had talented people, and were, in some ways, a little lucky. I think the future is going to be even more spectacular than the past."

DAVID JUDD

Dave joined the Company in 1975. He remembers that Seymour came and shook his hand on his first day of work. Since that time he can be described as "off and running." He was involved in the early benchmark work for NCAR and put forth a tremendous effort in writing the original CAL assembler, a project that has been described as "a three-man-year effort that was complete in eight months." He has moved through the software ranks with various assignments, and at present, is responsible for software development for the CRAY-2.

In thinking back on the early days at NCAR, Dave remembers long days when you "only worked, ate, and slept—sometimes for several weeks without a break." But he doesn't remember it as a negative time. Rather, it was a time of working with highly dedicated and highly motivated people. Simply put, "Nobody wanted a failure, so we did whatever had to be done."

In discussing what the switch to UNICOS will do for the company, Dave had this to say: "UNICOS is going to allow us to keep up with the rapid rate of change in our hardware. The changes we have had to make so far to accommodate new hardware will be minor compared to what we are going to see in the future. UNICOS is going to allow us to move to the new machines without killing ourselves."

In looking forward to the critical issues facing us, Dave said, "An increased effort on management's part and everyone's part will be required to coordinate small groups working in similar areas. They need the freedom to be creative and to accomplish their tasks, but need to also work in harmony with other small groups."

EDNA BUNN

Edna came to work for Cray in August 1972 as the company's ninth employee. She was hired to work as an administrative assistant with Seymour. Prior to Cray, she worked at Control Data Corporation with Seymour. At present she is a Senior Administrator and works with Les Davis. She is also responsible for the weekly edition of "Cray Chips." Over the years she has contributed articles to "Interface" and has a stored wealth of knowledge about the company's history.

The following is a summary of Edna's memories of the company's first four years.

"The company was officially founded on April 6, 1972. At the end of '72, the company records show we had 11 employees. We started out in a rented space owned by Tschopp-Dorch-

Camastral. That building is now Bill's Surplus Store. From there we moved to Hallie Labs. It was a functional building with few frills. The draperies (which were very handsome according to Edna) were made by Seymour's daughter, Caroline."

"By 1976, when we were ready to ship Serial 1, the number of employees had grown over 400 percent. The company had 48 employees at that time. Of course that included engineering, marketing, manufacturing, software— all the functions."

Serial 1 was shipped on a snowy, miserable day. But it was a day of excitement with people milling around. People were not overly nervous because many had come from Control Data Corporation and had gone through building the 6600 and 7600. She said, "We all had confidence in Seymour and didn't have a doubt it would work. After we shipped Serial 1, Les Davis took over production of the machine and Seymour and Harry Runkel started on the next machine."

When asked how the company has changed over the years, Edna believes the size is the greatest change, but she is quick to mention that we strive to maintain the importance of individuals. She believes one factor that has contributed to this is the accessibility of our executives. She commented: "You can call John Rollwagen on the phone and talk to him. Seymour doesn't take as much part in these affairs, but I can call him if I need to. He knows I wouldn't bother him with something that isn't important."

On a personal note, during my first visit to Chippewa, I was impressed with the friendliness of the people I met. I asked Edna if this was typical of Wisconsin people or Cray. She replied, "I think it is part of Cray. We believe in the Cray Style—not to take ourselves too seriously. We have a terrific business and a terrific product, but we don't sacrifice the value of people for the success of a system."

BOB EWALD

Bob joined Cray in 1984. Before that he worked for Los Alamos National Laboratories (LANL). He joined LANL about the time Serial 1 was installed. During his tenure with LANL, he was head of the Computing and Communications Division for five years and, therefore, heavily involved in the operations and procurement of Cray systems. He presently holds the position of Vice President of Commercial Marketing.

In discussing the introduction of Serial 1 to LANL, he explained that, "At the time, LANL's existing systems were saturated and that was putting a constraint on LANL's technical programs." They

were looking for a system with a performance improvement of 2 to 4 times over their present systems. They felt that Serial 1 would be able to deliver that level of performance.

Since that time, Cray and LANL have continued to have a strong relationship. LANL is continually looking for new technology that will help them in their applications and Cray has been supplying them with some of that technology for the past 10 years. Additionally, Cray listens to their input when discussing new system features and design trade-offs.

In further discussion, Bob said, "Our early customers positively influenced many of our present customers and continue to influence potential customers. Our early customers were able to demonstrate the feasibility and utility of running a supercomputer." As our positive reputation grows many potential customers visit our existing customer sites to see the CRAY systems and how they are being used. In addition, those first users of CRAY systems had a great deal of influence on Cray in terms of system architecture and performance.

When asked what he thought would be required of us to maintain our leadership in supercomputers, he made the following reply, "On the hardware side, we need to continue to be the performance leader with hardware that overall offers the best balance to users. We need to have optimum scalar and vector performance, and we need to continue to be the leader in parallel processing hardware and its application. On the software side, the world of supercomputing is changing. The new customers today expect a rich and robust software environment. The existing customers are solving more complex problems, using more real time simulations, and using different languages. So Cray on the software side needs to increasingly provide the highest performing, most efficient FORTRAN environment possible. In addition, we need to be responsive to the needs of increasing network and workstation environments. We need to also provide an operating environment that allows for the user codes to access all the hardware features. And, of course, our software needs to be at least as reliable as the competitors."

REGION MANAGERS' VIEWS

THE CENTRAL REGION . . . THE WAY THINGS WERE

by Laura Wallace

Organizations tend to evolve over time, and often people in those organizations see both positive and negative changes. In this historic tenth year of the Central Region, I interviewed some of the Region's "old timers" about their experiences: how it was then and how it is now, working for Cray and the Central Region.

I asked these five-year-plus employees what they remember about their first day on the job with Cray. Most often I heard words like "overwhelmed," "excited," "slightly bewildered" and at the extreme, "total panic." Most of these folks spent their first day with Cray in training and many of them mentioned that the high caliber of

technical training available now is one of the most positive changes they see about Cray.

Dave Hixson, Pre-Sales Analyst, came to the Central Region seven years ago when it was just a small office in Boulder with a few people. Dave said that what he really liked about the Central Region was the informality and the fact that "no one was looking over your shoulder as long as you did the job you were hired for."

Teresa Fenn Homan was the Region's first Field Engineering Secretary five and a half years ago. What she liked about Cray was the spirit of independence. "Cray hired people who knew how to do a job and then let them 'go for it.'" She mentioned that "even with the phenomenal growth we're experiencing, we never have to lose the importance of the individual." She sees that growth and change has brought a re-orientation, a shifting of identification from Cray, the company, to smaller work units like the Regions or Chippewa.

Ron Larson, Region Software Support Manager, came to the Central Region as an analyst six years ago. He remembers that the people who worked

for Cray back then were "a bunch of gunslingers who had total freedom to do the job that needed to be done." He also said that the Region was really the frontier then, and he has enjoyed watching the district "outposts" grow, adding needed stability. He sees the biggest change to the Region in that we are more structured now and "we expect more of each other."

Lou Collins, EIC at Los Alamos, remembers when he came to Cray. The company was small enough so that you knew everybody; things were more personal then. He likes the fact that field engineering now has more of a Region focus (formerly all Field Engineers reported to Chippewa) and believes that Cray people are becoming more professional. Lou is very proud of the growth that Los Alamos has experienced since he's been with Cray.

When Jim Martinez, EIC at NCAR, came to the Central Region five years ago, it was because of the opportunity to learn about a "spectacular machine." He sees that with technology and product change speeding up, we "need to guard against being overwhelmed by the changes . . . we need to stay flexible." He likes the fact that the Region organization makes it easier for employees to identify more with Cray rather than the customers.

Ed Boyle, Region Technical Support Engineer, remembers back almost 10 years ago when he worked in Chippewa Falls. His first impression of the testing equipment used in training engineers was: "This stuff won't work; everything was makeshift." Cray had only 150 people back then, and Ed sees the overwhelming growth as causing the biggest changes at Cray: growth that causes delays in getting things accomplished. He says "there are so many levels and links to the chain of events involved in getting things done."

Mark VandeRiet, Field Engineer at NCAR, is another veteran of almost ten years who started out working on serial numbers 2 and 3 in the Hallie Lab building. When he finally went to engineering field support, he said, he felt alone, with a lot of responsibility. He feels the Region organization provides more support now to the folks in the field. He likes the sense of identity that being part of the Region provides.

Maybe I just asked all the right people, but all the ones I interviewed are glad to be part of the Central Region and Cray. Many of them look back somewhat wistfully to the way things were. Growth and more structure have been unsettling to all of them - the transitions and changes are painful but necessary. As Ron Larson puts it: "It's hard for gunslingers to turn into farmers!"

CRAY: THE CHALLENGE - THE OPPORTUNITY

by Sonya Anderson

We hear a lot about how Cray has changed. It has. We have more of everything—products, customers, money, opportunities, and problems to solve—all of which is good news.

And perhaps the best news is that the most important parts of Cray have not changed.

Cray's primary focus remains the same—to push technological and marketing boundaries.

The only way that we can make advancements in technology and sales is to push our individual boundaries—which is also the way we fulfill ourselves and experience achievement within a corporation.

The Cray Style means that Cray is dedicated to minimizing corporate-imposed obstacles to getting the job done. As a result, I believe that when we as individuals or groups yearn to make technological, organizational, or marketing breakthroughs, our struggles are usually internal ones to break through our self-imposed attitudes of what we think we can do.

Here, too, Cray is unchanged; we still work within a culture that pushes us into opportunities to excel, promotes technical and individual risk-taking, and provides us with the training and tools to do so.

These are the gifts that Cray Research provides beyond salaries and bonuses—"providing diverse people with the opportunity to fulfill themselves and experience achievement."

FUNDAMENTALS

by Steve White

A friend of mine sometimes talks about how important it is to "dance with the gal what brung ya" - it's one of those great analogies that contains a whole lot of sense.

At Cray Research, and in our own Central Region, we do lots of new and exciting things. We deal with new technologies, new customers, new applications for supercomputers, and so on.

New is great and I love it, and you probably do too. We've done lots of it at Cray Research and will do lots more in the future. But . . . it's very important to remember and continue to do what brought us to where we are as the world leader in supercomputers.

In Field Engineering, that means a close relationship with the machine and the customer. Technical excellence must be coupled with solid engineering principles such as attention to detail and craftsmanship. Dedication to thorough problem-solving and "going the extra mile" in difficult situations is a given. Maintaining our leadership means having a concept of ourselves as professionals who do what we do better than anyone else. It also means **working intentionally** to improve system performance. And, perhaps as importantly, it means doing the fundamentals **right the first time** every day.

Leading edge technology and working on the frontier are **great.** Cray Research will be there as long as we "stick to the basics" and don't lose the vision of our mission. "Dancin' with the gal what brung us" keeps the music playing.

A TRIAD OF EFFORT

by Jim Merrell

The success of the Central Region in its next 10 years will come from the same things that have driven the successes of the past: a focused triad of efforts. That triad of sales, technical support, and service, will not change. It takes professional salesmen to find and develop accounts. Technical support for that sales effort is vital in our sophisticated markets. Without service for what we sell, the best sales effort would soon fail. So we have now, as in the past, a true triad of effort in this Region, welded together by the glue of teamwork among the Sales, Analyst, and Field Engineering organizations.

The sales part of this triad is changing. Through conscientious application of teamwork to our installed and closing accounts, we will be able to dedicate more of the salesmen's time to prospecting: the process of finding and qualifying new accounts we do not even know about today. Here, it is productivity through teamwork that is the key, making sure that with each prospect and at each site, the triad is in operation, communication is flowing, every team member knows his or her role and each depends on the other to perform their respective roles.

This emphasis on prospecting is real, not only in the Region, but throughout the company. The resultant emphasis on teamwork is not the only change underway in the Region sales force. The other change is growth. We started the year with six salesmen in four locations. We plan to end the year with ten to twelve salespeople in seven locations. This kind of growth is needed to sustain and expand our business in the next decade.

In summary, the keynote for our second decade of Central Region sales is our investment in the future. We have a plan in place to move us into the future and we are implementing it now.

NEWCOMERS SPEAK OUT

CRAY STYLE - A CENTRAL POINT OF VIEW

by Gail Gross

Throw out the definitions you brought with you to Cray—definitions of jobs, of structure, of companies, of **territory.**

Think of other concepts: innovation, risk, self-development, challenge, hazard, adventure, boundaries, team-building, change, and growth.

Cray Research is on the cutting edge of supercomputer technology, and frequently on the cutting edge of personal growth.

Being on the cutting edge—always on stage and playing to a full house—demands a repertory company with enormous stamina, flexibility, creativity and courage. It's like a balancing act, a tightrope walk in a high wind when we're not sure there's a safety net.

And if there's **not** we're not sure we care.

Keeping our balance isn't simple. Just as in other companies, we have a certain amount of bickering, gossip, doubt, jealousy, and internal competition. At times we define our territory and defy anyone to cross that invisible line.

But we're going to stay balanced, going to keep wowing that audience, because the cast is learning that it's a team, and that the success of the play depends on the strength of that team.

Cray Research is not a disembodied, bureaucratic entity. Cray is people: a cast of wildly individualistic characters whose roles require us to wow the audience every night—as a team. We are individuals, but we must be at rehearsals on time. We follow directions in order to move about smoothly on stage. We feed each other cues for coordination of effort.

Central Region forms part of Cray's overall structure. Sometimes we're so flexible the structure is nearly nonexistent; sometimes we're a little too rigid. We are changing, experimenting as we grow.

Each Region and Subsidiary of Cray is structured a little differently. Central Region's framework of Administration, Human Resources, Finance and Training, is supported by and supports the heart of Cray Central:

> Field Engineering - Software - Sales - Presales
> Region Engineering Technical Support
> and Region Software Technical Support

Don't take the above as a sign of importance or rank, because what we have here is a team.

Sales finds the customers; Presales and Sales work with them to refine their needs, and the Region's Engineering and Analyst organizations work to meet those needs.

Software Application Analysts act as consultants, helping customers run their programs on Cray's supercomputer systems—which Field Engineers and Software System Analysts maintain—and which were sold by Sales.

Central Region's Engineering and Software

Technical Support are firefighters, scrambling to answer distress calls, supplying engineering and analyst expertise wherever and whenever needs arise.

When there's a problem in the field, all groups find themselves acting as question-answerers, representing Cray to the customer.

With basic hardware knowledge, analysts can maintain Cray software and help the customer use Cray software more effectively. With a basic knowledge of software, engineers can maintain hardware more effectively. With basic hardware and software knowledge, salesmen can represent Cray more effectively. Without a basic knowledge of the principles of customer relations, no one communicates anything to the customer.

All of Central Region's cast of characters form a professional team.

If there is no sharing of knowledge, no willingness to yield stage position—**territory**—there is no team.

The play closes.

At Cray Central, all the cast members play interlocking, interdependent roles which run as long as there's an audience.

Every customer is an audience.

No one job is more important than another. No single role stands alone.

The customer—the audience—sees the play; the entire cast takes the bows.

CRAY RESEARCH: THE LIFE OF AN IDEA

by Mark Skidmore

In the beginning there was an idea conceived in the birthplace of the mind—nurtured by the experience of working with ideas of the past—guided by a feeling not vocally expressed, but very much present. The gestation period proved to be long and arduous. Countless hours were spent in making the idea operational. A gamut of emotions were felt, from frustration and anger to happiness and exhilaration. The time appointed for delivery arrived at last. On the faces of many could be seen quiet anticipation. The idea had matured into a tangible entity—a machine. More exactly, a Cray supercomputer, Serial 1.

But what did it mean, this idea that matured into a machine? To the scientific community, it would prove to be the ability to explore new frontiers. To those who had given so much of themselves, it was the fulfillment of four years of effort. But an ordeal was ahead. For although the birth had occurred, Serial 1 now faced the challenge of surviving infancy. A potential customer agreed to test the machine, and it was shipped on a trial basis without software.

Many potential future customers focused attention on Serial 1. As a group, they wondered if it would be able to supply the critical speed and reliability needed to gain acceptance. It passed the test, and thereafter was leased.

Orders for the machine began to come in. The idea that had matured into a machine was now leaving its infancy. It was building and selling more and more machines. Soon it would take on the attributes of a company. In addition, new ideas and questions were arising in the midst of this metamorphosis; questions about the number of customers and applications; ideas about new machines.

More time passed, and the establishment of a customer base gave revenue to develop the ideas for new machines into reality. Of course, it required hard work and effort similar to that with the first machine. Yet something was different. There was a new feeling present—not a good or bad feeling—but new; a feeling of increasing speed. The company was now leaving its adolescence. Two different machines were being built and sold; others were being developed. The company was evolving into a corporation.

With this stage of development came a large increase in the number of people employed. In addition, the work process and tools were becoming increasingly complex. A discussion arose; at dispute was the course the corporation would take in the future. Some were of the opinion that a conglomerate with many products would arise. Others stated that a bureaucracy with rules and politics would evolve. But the majority hoped the future would be charted by remembering that the present is accomplished by the efforts of the past, and that the future is determined by the efforts of the present; by remembering the beginning was a time of risk, a time of high energy, but above all a time of commitment to an idea—an idea that matured into a machine.
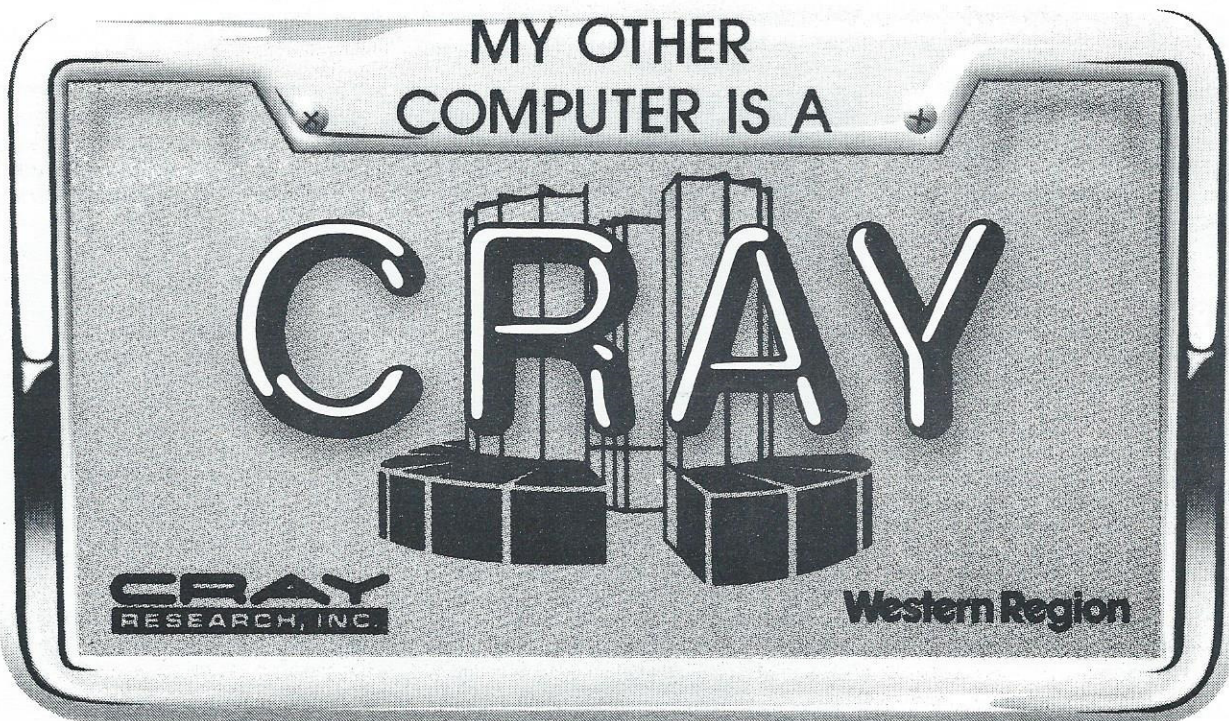
The latest in bumperstickers (compliments of the Western Region).

CENTRAL REGION SALUTES THE SITES

MDC (standing, left to right) Jeannine Van Dillen, David Guthrie, Ken Whites, Bob Moore (seated, left to right) Brian Payton, Mike Jadud (not pictured, Kathy Eudy).

MCDONNELL DOUGLAS

McDonnell Douglas Corporation is a world leader in the development and application of aerospace technology and is emerging as a significant supplier of information related products and services. Major product lines are combat aircraft, transport aircraft, space systems and missiles, and information systems. The corporation is active also in commercial financing and leasing and energy systems. Their line of combat aircraft includes the following: F-15 Eagle, F/A-18 Hornet, AU-8B Harrier 11, and the AH-64 Apache.

They received their first Cray system, a CRAY X-MP/14, Serial 322 in the last week of May, 1986. They plan to use the machine for aerodynamic simulation of airplanes and airplane sections.

SYSTEM DEVELOPMENT CORPORATION/ AIRFORCE WEAPONS LABORATORY

System Development Corporation (SDC) is the strategic business unit of Bourroughs Corporation, responsible for information systems and services for the government market. They are involved in command control, aerospace management, secure networks, intelligent systems, and signal processing. In the Central Region, SDC serves as the prime contractor at the Airforce Weapons Laboratory in Albuquerque, New Mexico.

Airforce Weapons Laboratory is involved in the research of military weapons. They received their first system, a CRAY 1/A, Serial 14, in February, 1980. It was replaced in January, 1981, with a CRAY 1/S, Serial 32. Serial 32 was later reinstalled in a new computer room at the site.

AFWL (left to right) Cassandra Shaw, Jimmy Neidert, Tim Juaire, Ginny Lowen, Darragh Nagel.

FORD (left to right) David Koenig, Doug Cook, Russ Eadie, Gordon Konz (not pictured, Lonnie Manning, Bob Steding).

FORD MOTOR COMPANY

Ford Motor Company is a worldwide leader in automotive and automotive-related products and services as well as in newer industries such as aerospace, communications, and financial services. Their stated mission is to improve continually their products and services to meet their customers needs, allowing them to prosper as a business and to provide a reasonable return for their stockholders, the owners of their business. They received their first system, a CRAY X-MP/12, Serial 308, in February, 1985. Their primary application is structural analysis using NASTRAN.

Part of the site history includes the time a field engineer from another vendor drove a motorized forklift through the raised floor. It severed the cables to three DD-29's and missed the main power line to the CRAY by about a foot. Although humorous now, it generated a lot of concern at the time. Eventually, an overhead crane had to be installed to take the forklift out.

Central Region Salutes the Sites

LOS ALAMOS NATIONAL LABORATORY (LANL)

Los Alamos National Laboratory (LANL) was the first Cray Research and Central Region customer. The Laboratory was established in 1943 as Project Y of the Manhattan Engineer District—the secret wartime program to develop the world's first nuclear weapons. The University of California was asked to manage the laboratory for the U.S. Department of Energy and continues to do so.

The laboratory has become one of the world's foremost scientific institutions. It currently conducts a wide spectrum of energy-related research. It has a total employment of approximately 7000. Of this, the technical staff numbers nearly 3000 (of which slightly more than half hold doctorates in their fields).

LANL took delivery of the first Cray supercomputer, CRAY-1/B, Serial 1, in 1976. They accepted the machine on a trial basis and without any software. The following year it was replaced with Serial 4. They received another system, a CRAY-1/A, Serial 16 in November 1979. In March of 1981, Serial 16 was replaced with the first CRAY-1/S, Serial 18. But before Serial 16 was loaded on to the truck to leave, they decided to keep it. So it was reinstalled about a month later in a new location in LANL. This meant LANL had three systems in operation.

LANL received its fourth machine in 1981, also a CRAY-1/S, Serial 35. Approximately a year later,

they received their fifth machine: a CRAY-1/S, Serial 50. Serial 50 had 4 million words of central memory and later also received an IOS (Serial 28) in preparation for LANL's first CRAY X-MP.

In October 1983, Serial 50 was moved to a new internal location to make room for LANL's first CRAY X-MP. This move was done by Central Region Field Engineers. On a Friday evening the machine was powered off and the move started. In 61 hours the machine had been disassembled, moved, reassembled, tested and returned to production. Two hours after completing this process, Serial 107, a CRAY X-MP/24 arrived on site and installation was begun.

In July 1984, LANL received a second CRAY X-MP/24, Serial 114. Earlier in the year Serial 50 had been de-installed and shipped back to Chippewa Falls. A year later LANL received their first CRAY X-MP/48, Serial 204. In August 1984, Serial 114 was de-installed and shipped to the University of Illinois. This opened space for LANL's second X-MP/48, Serial 206.

In summary, LANL now has the following seven systems in operation:

CRAY-1/A SERIAL 4
CRAY-1/A SERIAL 16
CRAY-1/S SERIAL 18
CRAY-1/S SERIAL 35
CRAY X-MP/24 SERIAL 107
CRAY X-MP/48 SERIAL 204
CRAY X-MP/48 SERIAL 206

In addition, there are 119 disk units that are tied to these systems.

The Central Region employees at LANL have established two annual events apart from the Cray-sponsored activites: an annual raft trip down the Rio Grande River and an annual summer picnic.

SANDIA NATIONAL LABORATORIES

SNLA (left to right) Dick Straw, Cassandra Shaw, Larry Clay, Mike Davis, Allen Ballweg, Bill Hill.

Sandia National Laboratories (then Sandia Laboratory) was established in 1945 and operated by the University of California until 1949 when AT&T assumed managerial responsibilities. Today Sandia is operated by AT&T Technologies, Inc. as a service to the US government on a no-profit, no-fee basis. Sandia was designated a national laboratory in 1979.

It is a multiprogram laboratory operated for the U.S. Department of Energy, with major facilities in Albuquerque, New Mexico, and Livermore, California. It is one of the largest research and development engineering facilities in the United States. Its primary responsibilities are research and development of nuclear weapon systems from concept to retirement. It also has extensive responsibilites in other areas of national importance that are related to its primary mission. These include fusion energy, reactor safety, nuclear safeguards, energy research, microelectronics, and other undertakings that utilize its research and development capabilities.

The Lab's headquarters are at Albuquerque, New Mexico. This is also the site the Central Region supports. They received their first Cray system, a 1/S, Serial 39, in January 1982. A second system, an X-MP/24, was installed in June, 1985.

LANL (left to right, back row) Gary Amundson, Hal Meyer, Tim Harrington, Bob Purdy, Wayne Sweatt, Lou Collins, Dave Thompson, Jason Smith, Mike Holly, Bob Hurtado. (left to right, front row) Kevin Davis, Debbie Finley, Alice Sandstrom, Sylvia Crain, Jeff Brown (not pictured, Tony Warnock).

U OF MN (left to right) Mark Jeche, Paul Pedersen, Lonny Isenburg, Jim Allshouse (not pictured, Scott Donoho).

U OF MN (standing, left to right) Carl Albing, Ken Lord, (seated, Rich Garrett) (not pictured, Robbie Cordo).

THE UNIVERSITY OF MINNESOTA

The University of Minnesota is one of the country's largest public universities with approximately 55,000 students (day and evening combined). It is also Seymour's alma mater. Additionally, it is one of the few universities in the United States to *own* a supercomputer. The University of Minnesota received its first system, a CRAY-1/B, Serial 12, in October, 1981. Soon after its arrival, it was upgraded to a CRAY-1/A. Since then, two other CRAY systems have been installed.

A one-CPU prototype CRAY-2, Serial QO2, was installed in October 1985. A second CRAY-2, Serial 2003, was installed in December 1985. It has four CPU's and 256 million words of central memory.

In discussing the site history, it was pointed out that Serial 12 has quite a bit of history of its own. It was manufactured during the autumn of 1978 for Software Development at Mendota Heights. The system arrived in Mendota Heights the second week of April 1979. The arrival of Serial 12 was a very big event for the company because it was the first Cray mainframe built for Cray Research, Inc. John Rollwagen and Margaret Loftus celebrated by serving hors d'oeuvres and Lienenkugel beer. However, the arrival of Serial 12 was not without adventure. While moving the mainframe from the moving van to its footprint in the computer room, the mainframe broke through the false floor and was listing at a twenty-degree angle. Approximately twenty brave employees ran to its rescue and physically righted the 6500 pound Cray computer.

Serial 12 had two successful years at Mendota Heights before being replaced by CRAY-1/S, Serial 25. Serial 12's next home was at Livermore, California. It was there from April to August, 1981 before it went to its present site at the University of Minnesota.

In 1985, the University of Minnesota created a privately owned company called Research Equipment Incorporated (REI) to manage and market time on the supercomputers. In this effort, they supply supercomputer services to industry, universities, and government for scientific and engineering research.

CONTROL DATA CORPORATION/ SCIENTIFIC INFORMATION SERVICES (CDC/SIS)

In September 1978, United Computing Services (UCS) installed a CRAY-1/B, Serial 8. This was the first installation of a Cray System in a commercial environment. In a gesture of goodwill, John Rollwagen presented J.D. Howard, United Computing Services Executive Vice President, with a commemorative plaque containing a mounted eightball (symbolic of the machine's serial number). UCS went through a few organizational and name changes over the years and was eventually purchased by Control Data Corporation in 1984. The name was changed to Scientific Information Services.

In November 1980, Serial 8 was replaced by a CRAY-1/S, Serial 23. In May 1986, Serial 23 was joined by a 1/S, Serial 48. In discussing the site history with the Cray employees, the following story came to the surface. One morning about 3:00 a.m., after the employees had worked almost two consecutive days on a hardware interrupt, someone suggested they do a biorhythm chart for Serial 23. And, sure enough, Serial 23 was scheduled for a double crisis day. In addition, it was scheduled for another major bad day in 18 days. True to form, it had an interrupt that day. Of course, the suggestion to use this as a new diagnostic tool was taken with a grain of salt.

CDC/SIS (left to right) Kathy Shockley, Gary Simala, Richard Kendall (not pictured, Erv Bentley, Debra Barnes).

GENERAL MOTORS RESEARCH

General Motors Research is involved in a wide variety of automotive research and development activities. They received their first system, a CRAY 1/S, Serial 37, in November, 1983. This was replaced by a CRAY X-MP/24 in April, 1986. They use their system to answer questions such as the following:

* How does air flow around the contours of a car?

* Aerodynamically, what is the best way to "end" an auto body? Taper it gradually? Or chop it off?

* How do molecules behave when a spark ignites gasoline in the cylinders of the auto engine?

* What forces are at work when a car collapses in a head-on collision?

Auto designers have been asking these questions and similar ones for years, but the use of the CRAY has tremendously reduced the time required to get the answers. In addition, it has made it possible to more fully test the design of new cars before an actual model is built.

DETROIT/GMR/EDS (left to right) Dale Sheils, Gloria Shlanger, Kevin Nolte, Dave Londo, Dave Garman, Bob Sabourin, John Walsh (not pictured, Bill Odell, John Kaiser).

SPERRY CORPORATION/AIR FORCE GLOBAL WEATHER CENTRAL

Sperry Corporation serves as the prime contractor at Airforce Global Weather Central. Sperry Corporation is a major supplier of ADP equipment to the Federal government, and has the largest installed base of computers in the Federal government.

Airforce Global Weather Central (AFGWC) provides the US Airforce and US Army with global information and products relating to past, present and future states of the aerospace environment. AFGWC is the Air Weather Service Manager for the collection and dissemination of aerospace environmental data. They are the largest military meteorological computer facility in the free world with resources consisting of 724 scientists and technicians and a large multi-mainframe computer complex.

They received their first CRAY system, an X-MP/22 in January, 1985. At present, they are working on developing a relocatable window model to allow full analysis and prediction of weather over a specific region.

One of the unique events in the site's history occurred at the time of installation. The system was shipped to Nebraska during an extremely cold spell. It sat on the moving truck over the weekend, enduring sub-zero temperatures. As a result, when the system was moved inside, the relative warmth and humidity of the computer room caused condensation all over the chassis. Water was actually running down the sides of the chassis and IOS. As you might suspect, they were a bit anxious about this condition. But the system was soon up and running with no negative effects.

AFGWC (left to right, back row) Rosanne Balser, Jeff Opincar, John Ingram, Jim Rye, (left to right, front row) Ken Bosak, Steve Twarowski, Don Balint, Rod Munson.